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requisite gift, in view of the strong probability that it will lead to a great advance in our knowledge of the heavenly bodies. Any one interested in this plan is invited to address the undersigned.

EDWARD C. PICKERING,

Director of the Observatory of Harvard College.
Cambridge, Mass., U.S.A., September, 1892.

Naltunne Tunne Measures.

WHEN the writer was at the Siletz Agency, Oregon, in 1884, he obtained the following units of measurement from Alex. Ross, the chief of the Naltunne tunne, an Athapascan people:—

1. The double arm's length, from the meeting of the tips of the thumb and forefinger of one hand to the meeting of the tips of the thumb and forefinger of the other hand.

2. Single arm's length, "one arm," extending from the tip of the middle finger along the extended arm to the shoulder-joint.

3. From the middle of the sternum along the extended arm to the meeting of the tips of the thumb and index finger.

4. From the inner angle of the elbow to the meeting of the tips of the thumb and index finger.

5. From the middle of the fore-arm to the meeting of the tips of the thumb and index finger.

6. From the first wrinkle of the wrist to the meeting of the tips of the thumb and index finger.

7. The width of the hand (when grasping a stick), "one grasp," equal to the width of four fingers (No. 11).

8. One finger width. 9. Two finger widths. 10. Three finger widths.

11. Four finger widths (the hand being open), equal to No. 7.

12. Five finger widths (including the thumb).

13. From the joint of the right shoulder horizontally across the body to the meeting of the tips of the thumb and forefinger of the extended left arm.

14. From the tip of the right elbow (the right arm being bent and held horizontally, the hand touching the shoulder) horizon-

tally across the body to the tip of the middle finger of the left hand, the left arm also being extended horizontally.

J. OWEN DORSEY.

Takoma Park, D.C., Sept. 13.

Omaha Arrow-Measure.

THE Omaha use the following as their arrow-measure: From the inner angle of the elbow to the tip of the middle finger, and thence over the back of the hand to the wrist-bone.

J. OWEN DORSEY.

Takoma Park, D.C., Sept. 13.

BOOK-REVIEWS.

Elementary Text-Book of Entomology. By W. F. KIRBY. Second Edition. Revised and augmented. Ill. New York, Macmillan & Co. 281 p. 8°. \$3.

ENTOMOLOGISTS everywhere will welcome with pleasure this new edition of Kirby's handbook of reference to the study of insects. As compared with the first edition of the work, we find the present one improved by the addition of a carefully prepared index, and by an appendix and table of contents. The appendix adds considerable new and valuable matter, while the last-named feature answers admirably to present the main divisions of the classification of insects used by the author. Various schemes of the latter are briefly discussed in the introduction, but our space will only admit of our saying here that seven orders are adopted to which the lesser groups of all insects are referred. These are the *Coleoptera* (including *Strepsitera*), *Orthoptera* (including *Euplexoptera* and *Dictyoptera*), *Neuroptera* (including *Trichoptera*, *Thysanura*, *Collembola*, *Mallophaga*, and *Thysanoptera*), *Hymenoptera*, *Lepidoptera*, *Hemiptera* or *Rhynchota* (including the suborders *Hemiptera*—*Heteroptera* and *Hemiptera*—*Hemoptera*, and the *Anophura*), and *Diptera* (including *Aphaniptera* and possibly *Achreioptera*). Our author tersely defines these several

Publications Received at Editor's Office.

DOBBIN, L. and WALKER J. Chemical Theory for Beginners. New York, Macmillan & Co. 16°. 244 p. 70 cts.
GEOLOGICAL SURVEY OF TEXAS. Annual Report, 1891. Austin, State. 8°. Paper. 470 p.
KIRBY, W. F. Elementary Text-Book of Entomology. New York, Macmillan & Co. 8°. 282 p. Ill. \$3.
WILKINSON, GEORGE. The Voice. 16°. Paper. 72 p.

Reading Matter Notices.

Ripans Tabules: for torpid liver.

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TO VOLUME XVIII OF SCIENCE

is in preparation, and will be issued at an early date.

Exchanges.

[Free of charge to all, if of satisfactory character. Address N. D. C. Hodges, 874 Broadway, New York.]

For Sale or Exchange.—The subscriber would like to receive cash offers, or an offer in exchange for the earlier volumes of Poggenдорff's *Annalen* and the later volumes of Silliman's *Journal*, upon the following list: Chenn—*Manuel de Conchyliologie*. 2 vols. Nearly 5,000 figures, some hand-colored. Paper. Paris, 1859. Edwards.—*Butterflies of N. A.* 2 vols. Plates hand-colored. Vol. I., half calf. Vol. II. in parts. Leyman, Agassiz, Hagen.—*Ills. Cat. Mus. Comp. Zool.* at Harvard. No. I. Ophiuridae. No. II., Acalephae. No. III., Astacidae. All bound in one volume. American Naturalist. Vols. I–VII. Cloth. Silliman's *Am. Jour. of Science and Arts*. Third Series. Vols. I–X. Cloth. Binney.—*Terrestrial Mollusks of N. A.* Colored plates. 4 vols. Stretch.—*Zygaenidae and Bombycidae of N. A.* Colored plates. Also a considerable library of monographs, reports, and scientific books, and a large number of duplicates of fossils, minerals and shells. E. A. STRONG, Ypsilanti, Mich., Sept., 1892.

Exchange.—I have the finest shells of *Anodonta corpulenta*, *Cypr.* and *Suborbiculata*, Say, in the world. Will exchange for fresh water, land, and marine shells, in large or small quantities. Have also for exchange 50 varieties of fresh water and land shells from Spoon River, Ill. Dr. W. S. STRODE, Lewistown, Ill.

To exchange for books on birds or insects, or for back volumes of *American Naturalist*: Ecker's "Anatomy of the Frog," Packard's "Guide," Guyot's "The Earth and Man," Rockhill's, "The Land of the Lamas," Parker's "Biology," Shoemaker's "Heredity, Health and Personal Beauty," Dexter's "The Kingdoms of Nature," all new. M. J. ELROD, Ill. Wes. Univ., Bloomington, Ill.

For Sale.—About 1087 volumes of the private library of Dr. Nicolas León, formerly director of the Museum at Morelia, embracing publications of special value for Mexicoologists, like those of Bishop Zumárraga (16th century), of Sigüenza y Gongora, of Aleman, etc., the *Missal* of Spinoza, all very scarce; manuscripts on the history of Michoacán and other Mexican States, on the Tarasco (the Indian language of Michoacán) and several works, of which the only copy known to exist is in this collection. Parties interested in the sale please address Dr. NIC. LEÓN, Portal de Matamoras, Morelia, Mexico.

Wants.

METALLURGICAL CHEMIST will give instruction in the metallurgy and chemical analysis of iron and steel. Complete or special courses applying to the manufacture of pig irons and steels, as well as to their uses. Address "METALLURGIST," care SCIENCE.

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A JOHNS HOPKINS graduate (1892) desires a position as instructor in mathematics and physics. Address A. B. TURNER, Johns Hopkins University, Baltimore, Md.

A YOUNG MAN, with a thorough training in Analytical Chemistry (including analysis of minerals, food, water, etc.), and holding a diploma of the School of Practical Science, of Toronto, and good testimonials, desires a position as Analytical Chemist or as assistant to such. Address to WM. LAWSON, 16 Washington Ave., Toronto, Ontario.

groups under their respective heads, in the various divisional chapters of the books which they constitute, while the minor groups below orders are treated under sections of these chapters with more or less detail.

Mr. Kirby, being an Englishman and a member of the British Museum staff, it is no more than natural that in his volume he has given British entomology especial consideration, but in so doing he has hardly impaired its value for a text-book to the science of the entire subject. Indeed, the American entomologist's library will be lacking a most useful auxiliary to monographic treatises unless possessed of a copy of this manual. Of all the species making up his seven orders, he states that no less than 12,600 are to be found in Britain, as compared with the 270,000 making up the insect fauna of the world. We see the book's greatest weakness in his introduction, where not sufficient attention has been given to the anatomy of insects, their study from a general standpoint, their distribution in time, their taxonomy and similar matters, all of which give the works of Packard such a peculiar value. Not a single cut illustrates the fourteen pages devoted to his introduction in a volume of nearly three hundred. On the other hand, it would be hard to accord too much praise to the 650 figures contained on 87 plates that embellish the book. To the general student, as a means of diagnosis of the main groups, they must prove of the very greatest assistance, portrayed as they are with marked accuracy, strength, and clearness. For the purpose mentioned, the *Coleoptera* are especially good, bold, and well drawn, though perhaps lacking in that refinement of detail which lends such beauty to the productions of Riley's pencil. Throughout the pages of Mr. Kirby's work we are pleased to find that he has not altogether neglected to consider the economic importance, or the reverse, of many insects to the agriculturalist, and to vegetation, forests, and plant-life, generally—a department now attracting such universal attention in this country.

Upon the whole, we may say that this handsomely gotten-up manual presents but little for adverse criticism, when we come to consider what the volume aims to give, while it offers a great deal to commend it, and it is a work that any entomologist in this country will be proud to see upon the shelves of his library, as it is one that the student of entomology will be constantly called upon to consult.

R. W. SHUFELDT.

Primitive Man in Ohio. Vol. I. By WARREN K. MOOREHEAD. New York, G. P. Putnam's Sons. 246p. 8vo. Illustrated.

THE problem, Who were the mound builders? has long been one which has interested students of the antiquities of the valley of the Ohio, without much unanimity of conclusion on the part of those who undertook to answer it. Whoever these ancient peoples were, Mr. Moorehead and his collaborators in the work before us have been enabled by a series of admirably conducted investigations to throw a new light on their arts and institutions. These collaborators are Mr. Gerard Fowke, Dr. H. T. Cresson, and Mr. W. H. Davis; each of whom contributes one or two chapters to the book, on special fields.

After an opening chapter on palæolithic man, there are descriptions of excavations in various sites, the most celebrated of which are Fort Ancient, Madisonville, and Hopewell's Tumuli. The discoveries in the latter were especially rich, and will figure prominently in the archaeological department of the Chicago Exhibition. They are particularly interesting as indicative of an extended use of metals, notably copper.

An examination of the skulls unearthed shows the contemporary existence of two groups, the one short-headed, the other long-headed; or, are they simply two cranial forms within the same population? This seems quite as likely.

The illustrations in the work are faithfully and well executed from the objects, and add both to the beauty and utility of the volume.

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